

## WE CLAIM:

1. An optical data recording medium, comprising:

a light transmittable plastic substrate; and

a recording layer formed on said plastic

5 substrate and containing a hydrogenated amorphous material that is selected from a group consisting of hydrogenated amorphous carbon, hydrogenated amorphous silicon carbide, hydrogenated amorphous boron carbide, hydrogenated amorphous boron nitride, hydrogenated amorphous silicon, and hydrogenated amorphous germanium.

2. The optical data recording medium of Claim 1, wherein said recording layer has a hardness greater than that of said plastic substrate.

15 3. The optical data recording medium of Claim 1, wherein said hydrogenated amorphous material decomposes and releases hydrogen at a temperature greater than 300°C, whereas said plastic substrate is softened at a temperature in a range of from 80°C to 300  
20 °C so as to permit formation of recesses in said plastic substrate as a result of the hydrogen released by said hydrogenated amorphous material.

4. The optical data recording medium of Claim 1, wherein said hydrogenated amorphous material  
25 contains 5 to 60 atomic percent hydrogen.

5. The optical data recording medium of Claim 1, wherein said hydrogenated amorphous material is

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hydrogenated amorphous carbon.

6. The optical data recording medium of Claim 1, wherein said recording layer has a thickness in a range of from about 30 nm to 2500 nm.

7. The optical data recording medium of Claim 1, wherein said plastic substrate is made from a resin material selected from a group consisting of acrylic resins, polycarbonate resins, epoxy resins, and polyolefin resins.

8. The optical data recording medium of Claim 1, wherein said recording layer is formed on said plastic substrate via plasma assisted chemical vapor deposition techniques by decomposition of a hydrocarbon with a pressure of 20 to 400 milli-torr and a substrate bias voltage in a range of from 250 to 550 volts.

9. The optical data recording medium of Claim 1,  
further comprising a reflective layer formed on said  
recording layer such that said optical data recording  
20 medium has a reflectivity greater than 40% in response  
to a wavelength of from 300 to 900 nm.

10. An optical data recording medium, comprising:  
a light transmittable plastic substrate; and  
a recording layer formed on said plastic  
substrate and made from hydrogenated amorphous carbon  
which contains 5 to 60 atomic percent hydrogen and  
which decomposes and releases hydrogen at a

temperature greater than 300 °C , said plastic substrate being softened at a temperature in a range of from 80°C to 300°C so as to permit formation of recesses in said plastic substrate as a result of the hydrogen released by said hydrogenated amorphous carbon.

11. The optical data recording medium of Claim 10, further comprising a reflective layer formed on said recording layer such that said optical data recording medium has a reflectivity greater than 40% in response to a wavelength of from 300 to 900 nm.

12. The optical data recording medium of Claim 10, wherein said plastic substrate is made from a resin material selected from a group consisting of acrylic resins, polycarbonate resins, epoxy resins, and polyolefin resins.

13. The optical data recording medium of Claim 10, wherein said recording layer is formed on said plastic substrate via plasma assisted chemical vapor deposition techniques by decomposition of a hydrocarbon with a pressure of 20 to 400 milli-torr and a substrate bias voltage in a range of from 250 to 550 volts.

14. The optical data recording medium of Claim 13, wherein said plastic substrate is held at a temperature of about room temperature during the formation of said recording layer.

FOOTNOTES 0420660